

 **dura·line**

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Channel Partner

HINDUSTAN PIPE SALES CORPORATION
H.O. 319, SYNDICATE HOUSE, INDERLOK, DELHI-110035
TEL: 011 45075768, 09810079112, 09873342538
EMAIL: hindustan.pipes@gmail.com, www.hindustanpipes.com



Mexichem.

Design By: www.wallcommunication.com

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Profile

Dura-Line

Dura-Line Corp. headquartered in Knoxville, USA is the largest producer of Poly Ethylene Ducts for Data transfer and Fluid Application. Dura-line is now a part of Mexichem, a global leader in Chemical and petro-chemicals based in Mexico. Dura-line serves client in over 120 countries from its manufacturing facilities at USA, Mexico, Czech Republics, South Africa, India and Oman.

About Dura-line India

DuraLine commenced commercial production from its Goa facilities in 1997. It has now five production units in India at Goa (two units), Neemrana (two units) and Hyderabad with an annual production capacity of more than Hundred Thousand Metric Ton per annum. Backed by a strong R&D and a large repertoire of cutting edge technology, offering, Dura-line has a tradition of providing quality products and services exceeding customer's expectation.

About Dura-Line Middle East

Duraline Middle East LLC is a joint venture between Duraline India and Al Jasser LLC, Muscat. The new state of the art manufacturing facility at Sohar, Oman has been commissioned to cater to the growing need of Middle East and North Africa (MENA) countries for their Water, Gas and Telecom requirements.

Dura-Line's Strength

- Global Foot Print – 16 manufacturing facilities, production over 250,000 MT per Annum
- World Class Manufacturing facilities and processes certified as per ISO 9001, ISO 14001, ISO 180001
- Innovative Product Range
 - Invented telecom duct PE co-extruded with Sillicore™
 - Duratrac™, Detectable Polyethylene pipe for traceability and depth assessment
- One-stop solution for fluid and telecom network project,
- Training services on site and at Goa Pipe learning Centre
- Product accreditation from Global agencies like WRAS, KIWA, DVGW, BVQI, TUV etc
- Exclusive supplier to Global Telcos like AT&T, Verizon, Vodafone, Airtel etc



PRODUCT RANGE

- **Infrastructure Pressure Pipe (Water and Sewerage)**
 - HDPE pipe for Water supply 20mm to 1000mm Nominal diameter as per various National and International standard in PE63/80/100 Pressure Rating PN 2.5 to Pn 25.
 - HDPE pipe for Seavrage & Storm Weather discharge.
 - Gas pipe as per various National and International Standards up to 315mm.
- **Agricultures and Landscaping**
 - Sprinkler Irrigation system for Agricultures, horticulture and plantation
 - Landscape irrigation system
 - Portable Sprinkler pipe with Quick Action couplers up to 160mm dia pipe.
 - Coil pipe for submersible pump in swallow and deep tube-well
- **Industry and Environment**
 - Effluent and Slurry transportation
 - Marine Outfall
 - Dust Control
- **Fittings and Specials for various application**
 - Fabricated, Tees and Bends up to 1000mm diameter
 - Molded PE Fittings up to 1000mm diameter
 - Compression Fittings
 - Electro-fusion Fittings

PRODUCT STANDARDS

Fluid Pipe and System: ISO: 4427, EN: 12201, DIN: 8075/ 8074, IS: 4984, IS: 14333, BS: 6437, MS: 1058, AS/NZS: 4130, IS14151, IS14885, ISO 4437

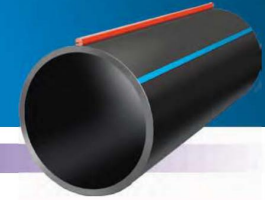
Range of Fittings: ISO: 4427, IS: 8008, IS: 8360

Double Wall Corrugated Pipe: as per IS: 14930



Mexichem.

APPLICATIONS OF DURA-LINE PE PIPE



PRESSURE PIPE FOR WATER, SEWAGE APPLICATION

Dura-Line Produces widest range of PE pipe from 20 to 1000mm dia as per various National and International standard using PE63/80/100 HDPE / MDPE resin as Raw materials. The pipes are manufactured in between PN 2.5 and 25 for various pressure applications. The plain ended solid wall pipes are used for Water Supply, Drainage, Storm Water Disposal etc.

Dura-line HDPE Pipe – Properties

PROPERTIES	VALUE
Properties Recommended Service Temperature	-45°C to +55°C
Color	Blue/Black
Vicinate Softening Temperature	125°C
Decomposition Temperature	360°C
Ultra Violet Stability	Excellent
Flow Factor (C Factor in Hazen Williamson formula)	150
pH factor of Conveyed Fluid	1.0 to 14.0
Melt Flow Factor	0.20 to 1.10 gms in 10 Min
Reversion	Less than 3%
Density	940.0 to 958.0 Kg/m ³
Impact Strength	Excellent
Resistance to Abrasion	Excellent
Life Expectancy	More than 50 Years

PE PIPE FOR TRANSPORTATION OF GASEOUS FUEL

Gas Pipes are being used by CGD (City Gas Distribution Companies) for transportation of the Gaseous fuel for domestic use. These pipes are also found use in transportation of Coal Bed Methane (CBM) / Natural Gas from mines to various industries.

Dura-line, Mexico has pioneered production of PE Gas Pipe in 1998 supplying PE Pipes to Resol, Gas de France, Gas de Suez, British Gas, Advatica etc. Dura-line, Goa has been the source of Gas Pipes for Asia & Africa.



Salient Features

- **Manufactured from Compounded MDPE Resin.**
- **Standards: ISO 4437, IS 14885**
- **Color of the Pipe**
 - Yellow for PE 80 Grade Raw Material, IS 14885
 - Orange for PE 100 Grade Raw Material, IS 14885
 - Black for PE 100 Grade Raw Material, ISO 4437
- **Pipes designated by SDR Value**

DuraFlo, KRISHI COIL PIPES FOR TUBE-WELL USE

- **DuraFlo pipe is one the most innovative product introduced for Tube-well application. This is a double layered PE pipe with an inner white solid lubricated layer to reduce friction.**
 - Reduces friction to flow, hence higher flow from tube-well is achievable.
 - PE does not rust or corrode – Long Life
 - Available in Coils: 100 to 1000 mtr
 - Diameter of Coil: 20mm to 110mm

SPRINKLER IRRIGATION SYSTEM

Dura-Line manufactures complete range of PE pipes and fittings for sprinkler irrigation system as per IS 14151 part 1 and part 2.

- **Duraloc: Couplers come with metallic C- type lock for ease in operation**
- **Durafit: Quick Action hook system for efficient locking.**
- **Necessary fittings like Bend, Tee, End cap are manufactured in house as per customer requirement.**
- **Sprinkler Nozzles with high co-efficient of Distribution are available as per IS 12232 Part-1.**
- **Uses in Field Crop, Tea and Coffee Gardens, Landscape etc**



PE PIPES FOR INDUSTRIAL APPLICATION

PE, due to its inert properties found application in handling chemicals, brine, sour water etc. It is also found uses in slurry and sand pumping due to its abrasion resistance quality.

Some of the popular application of PE pipe in various Industries.

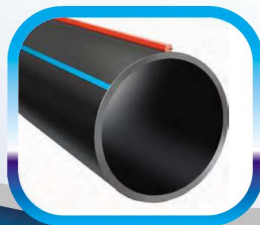
- Effluent disposal,
- Marine Outfall line / Sea Water Intake.
- Under sea installation of pipe for transportation of potable water.
- Liner Pipe in Petroleum Industries
- Transportation of DM Water,
- Slurry transportation,
- Dust Suppression system in mines and haul road,
- Dewatering.
- Mineral Washeries.

DURATRAC™ AND DURASURE

Dura-Line Water pipe and telecom ducts are available with a co-extruded highly conductive copper wire encased in HDPE along the length of the pipe. The wire transmit a low frequency electro-magnetic signal from a receiver. The signal from the copper wire is received by a hand-held receiver providing exact location (Latitude, Longitude, depth etc) in the backlit LCD display. The receiver can be connected by GPS to download the data on the PC. Necessary jointing kits and tools are also available for jointing the pipes across valves, fittings etc.

Advantages:

- Gives quick and precise location of the underground piping system.
- Use of electronic detection device with such pipes offers inch-by-inch accurate traceability.
- Facilitates precise digging during maintenance activity thereby saving on time and labor – and associated cost
- Avoids damage to other utilities buried underground – avoid penalties
- Keep a check on the accuracy of as-built drawings.



FITTINGS AND ACCESSORIES

A wide range of fittings are available for installation of HDPE Pipes as per site requirement and purpose. The range of fittings can be separated into three classes.

Butt fusion Fittings

- Bends, Tees, End Cap, Pipe Ends, Flanges etc
- Can be fabricated or Molded
- Standards: ISO 4427, IS 8008, IS 8360 etc
- Low Cost
- Fittings can be tailor made
- Range 20mm to 1000mm dia

COMPRESSION/ MECHANICAL FITTINGS

Compression fittings are very popular for water supply network. Compression Saddles, Compression Couplers, bends etc are cost effective in lower diameter.

- Ease in installation (Does not need Welding machine at site)
- Tapping saddles are very popular for House Service Connection
- Easy and Quick repair of damaged pipe

ELECTRO-FUSION FITTINGS

Electro-fusion fittings come with in-built electrical heating element, which generates heat when connected to electric source. The resulted heat fuses the fitting with the pipe uniformly offering an extremely reliable joint.

- Fittings: Couplers, Bend, Tee, Saddles etc are very popular,
- Widely Used in Gas supply pipe line,
- Reliability of Fittings are very high,
- Cost of Fittings high
- Needs qualified mechanics for jointing.
- Fittings available up to 630mm dia



JOINTING METHODS

Butt Fusion

Butt-welding method is most popular and economical method of joining PE pipes. Butt welding machine are available for installation up to 2000mm dia pipe. A typical butt welding machine consists of following mechanisms:

- **Shaver** to clean the sides to be joined together and making them parallel to each other,
- **Heating Mirror** to provide heat on its sides, so that the jointing ends soak heat and bids are formed of the molten resin,
- **Hydraulics** to press together the pipes and hold them together for eventual fusion.
- **Other accessories:** Clamps, Crane, Trolley etc

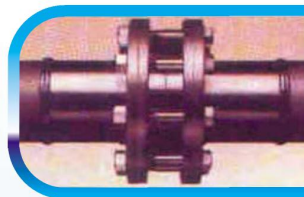
Electro-fusion Jointing

Jointing is done by electro-fusion fittings. The ID of the fittings matches to the OD of the pipe, so that ends of the pipes are easily pushed into both side of fitting. Power source is connected to the resistance coil inside the fittings generating requisite heat to fuse the pipe and fittings together.

Mechanical Joints

Mechanical Joints provide the joints, which can be detached for servicing etc.

- **Compression Joints** – Joined by Compression fittings (Coupler, Bends, Tees etc)
- **Flanged Joints** – Pipe End and Slip on Flanges (MS/ PE) can be used on both sides of the pipe for jointing them by nuts, bolts and Washers.



ADVANTAGES OF PE PIPE

- **Smooth Inner wall (C-Value: 150)** offers minimum resistance to flow then reducing operating cost.
- **Long life:** Life expectancy more than 50 years
- **High Impact Strength / Flexible.** Pipe available in coil up to 110mm diameter.
- **Light Weight** – Low transportation Cost and ease in installation.
- **Food Grade Material** – highly recommended for Potable water. No bacterial or Algae growth.
- **Temperature resistance:** -40 to 60 Deg Celsius.
- **Resistance to UV Ray**
- **Excellent Water Hammer / Surge characteristics.**
- **Preferred Material for Horizontal Directional Drilling, Pipe bursting etc.**
- **Leak Proof Joint.** Jointing by Butt fusion, with jointing strength higher than the pipe.

TRAINING ACADEMY

Duraline-Plumettaz Academy has been established inside the Goa plant with the objective of imparting training on the best world-wide practices and advanced techniques of Fiber Network roll out.

The Learning Center Imparts knowledge and learning related to polyethylene and piping systems and pipeline installations. Towards this objective the Learning Center conducts training programs for personnel from corporates, municipalities, PWD (public works departments), industrial plants, mining companies, consultants and contractors.



COMPARISON AMONG VARIOUS PIPE MATERIAL



Sr. No	Property	HDPE	P.V.C.	Mild Steel (MS)
1	Life	>50 years underground.	More than 20 years(When not exposed to sun)	Less than 10 years under protection
2	Health Hazard	No additives during Manufacturing. Hence totally safe	Lead based stabilizer causes long term health hazard	Corroded pipes allow out side contaminated water to seep into the system.
3	Weathering Resistance	Good due to presence of Carbon Black	Tends to becomes brittle when exposed to sun.	Poor resistance against Corrosion and chemicals
4	Recommended Temperature	"-40 to +50 Deg C"	"+1 to+45 deg C"	Can stand any temperature
5	Chemical Resistance	High degree of resistance to acids alkalis and high anti corrosive properties	Moderate resistance to most alkalis and acids	Poor
6	Water hammer characteristics	Excellent water hammer characteristics.50% better than in MS and 30% better than PVCpipes	Need higher diameter pipelines to control surge pressure under similar conditions as that of HDPE	Poor resistance to absorb surge wave. Needs thrust blocks.
7	Flexibility	Highly Flexible Can be bent over curves. Requiring very fewer fittings	Limited flexibility and requires lots of fittings and specials during installation	Highly Rigid. Needs huge fittings and specials
8	Lengths	Pipe up to 110 mm can be supplied in Coils of 100 Mt. Small dia pipe can be supplied in 1000 Mt.	Comes in straight lengths of maximum 6mts	Comes in straight lengths of maximum 6mts
9	Load bearing capacity	Flexible. Deform under load and recovers on its release.	Low impact strength. Cracks under heavy loads.	Can take high dead load and live load
10	Maintenance	Virtually Maintenance free	Regular maintenance to replace broken parts.	High maintenance after few years of use
11	Internal / External Coatings	Not Required	Not Required	Requires coating to prevent corrosion and reduce friction
12	Soil Settlement	Resistance to ground movement, even earthquakes	Poor resistance to Soil movement	Poor resistance to Soil movement
13	Friction to Flow	Smooth inside surface. C Factor-150. Lowest resistance to flow	Smooth inside surface. C Factor-150. Lowest resistance to flow	Rough inside surface. Roughness increases with age

Wall Thickness of PE Pipe as per ISO 4427/ EN 12201

	SDR 41		SDR 33		SDR 26		SDR 21		SDR 17		SDR 13.6		SDR 11		SDR 9		SDR 7.4		SDR 6		
PE 63	PN 2.5		PN 3.2		PN 04		PN 05		-		PN 08		PN 10		-		-		-		
PE 80	PN 3.2		PN 04		PN 05		PN 06		PN 08		PN 10		PN 12.5		PN 16		PN 20		PN 25		
PE 100	PN 04		PN 05		PN 06		PN 08		PN 10		PN 12.5		PN 16		PN 20		PN 25				
	S 20		S 16		S		S 10		S 8		S 6.3		S 5		S 4		S 3.2		S 2.5		
Nominal meter	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
16																2.00	2.30	2.30	2.70	3.00	3.40
20														2.00	2.30	2.30	2.70	3.00	3.40	3.40	3.90
25												2.00	2.30	2.30	2.70	3.00	3.40	3.50	4.00	4.20	4.80
32										2.00	2.30	2.40	2.80	3.00	3.40	3.60	4.10	4.40	5.00	5.40	6.10
40								2.00	2.30	2.40	2.80	3.00	3.50	3.70	4.20	4.50	5.10	5.50	6.20	6.70	7.50
50					2.00	2.30	2.40	2.80	3.00	3.40	3.70	4.20	4.60	5.20	5.60	6.30	6.90	7.70	8.30	9.30	
63					2.50	2.90	3.00	3.40	3.80	4.30	4.70	5.30	5.80	6.50	7.10	8.00	8.60	9.60	10.50	11.70	
75					2.90	3.30	3.60	4.10	4.50	5.10	5.60	6.30	6.80	7.60	8.40	9.40	10.30	11.50	12.50	13.90	
90					3.50	4.00	4.30	4.90	5.40	6.10	6.70	7.50	8.20	9.20	10.10	11.30	12.30	13.70	15.00	16.30	
110					4.20	4.80	5.30	6.00	6.60	7.40	8.10	9.10	10.00	11.10	12.30	13.70	15.10	16.80	18.30	20.30	
125					4.80	5.40	6.00	6.70	7.40	8.30	9.20	10.30	11.40	12.70	14.00	15.60	17.10	19.00	20.80	23.50	
140					5.40	6.10	6.70	7.50	8.30	9.30	10.30	11.50	12.70	14.10	15.70	17.40	19.20	21.30	23.30	25.80	
160					6.20	7.00	7.70	8.60	9.50	10.60	11.80	13.10	14.60	16.20	17.90	19.80	21.90	24.20	26.60	29.40	
180					6.90	7.70	8.60	9.60	10.70	11.90	13.30	14.80	16.40	18.20	20.10	22.30	24.60	27.20	29.90	33.00	
200					7.70	8.60	9.60	10.70	11.90	13.20	14.70	16.30	18.20	20.20	22.40	24.80	27.40	30.30	33.20	36.70	
225					8.60	9.60	10.80	12.00	13.40	14.90	16.60	18.40	20.50	22.70	25.20	27.90	30.80	34.00	37.40	41.30	
250					9.60	10.70	11.90	13.20	14.80	16.40	18.40	20.40	22.70	25.10	27.90	30.80	34.20	37.80	41.50	45.80	
280					10.70	11.90	13.40	14.90	16.60	18.40	20.60	22.80	25.40	28.10	31.30	34.60	38.30	42.30	46.50	51.30	
315	7.70	8.60	9.70	10.80	12.10	13.50	15.00	16.60	18.70	20.70	23.20	25.70	28.60	31.60	35.20	38.90	43.10	47.60	52.30	57.70	
355	8.70	9.70	10.90	12.10	13.60	15.10	16.90	18.70	21.10	23.40	26.10	28.90	32.20	35.60	39.70	43.80	48.50	53.50	59.00	65.00	
400	9.80	10.90	12.30	13.70	15.30	17.00	19.10	21.20	23.70	26.20	29.40	32.50	36.30	40.10	44.70	49.30	54.70	60.30	--	--	
450	11.00	12.20	13.80	15.30	17.20	19.10	21.50	23.80	26.70	29.50	33.10	36.60	40.90	45.10	50.30	55.50	61.50	67.80	--	--	
500	12.30	13.70	15.30	17.00	19.10	21.20	23.90	26.40	29.70	32.80	36.80	40.60	45.40	50.10	55.80	61.50	--	--	--	--	
560	13.70	15.20	17.20	19.10	21.40	23.70	26.70	29.50	33.20	36.70	41.20	45.50	50.80	56.00	62.50	68.90	--	--	--	--	
630	15.40	17.10	19.30	21.40	24.10	26.70	30.00	33.10	37.40	41.30	46.30	51.10	57.20	63.10	70.30	77.50	--	--	--	--	
710	17.40	19.30	21.80	24.10	27.20	30.10	33.90	37.40	42.10	46.50	52.20	57.60	64.50	71.10	79.30	87.40	--	--	--	--	
800	19.60	21.70	24.50	27.10	30.60	33.80	38.10	42.10	47.40	52.30	58.80	64.80	72.60	80.00	89.30	98.40	--	--	--	--	
900	22.00	24.30	27.60	30.50	34.40	38.30	42.90	47.30	53.30	58.80	66.20	73.00	81.70	90.00	--	--	--	--	--	--	
1000	24.50	27.10	30.60	33.50	38.20	42.20	47.70	52.60	59.30	65.40	72.50	79.90	90.20	99.40	--	--	--	--	--	--	

Wall Thickness For PE Pipe as per IS: 4984

Diameter	Pr. Class	PE 63		PE 80		PE 100	
		Min	Max	Min	Max	Min	Max
mm	PN	mm	mm	mm	mm	mm	mm
20	10	2.3	2.8				
20	12.5	2.8	3.3	2.3	2.8		
20	16	3.4	4.0	2.8	3.3	2.3	2.8
25	8	2.3	2.8				
25	10	2.8	3.3	2.3	2.8		
25	12.5	3.4	4.0	2.8	3.3	2.3	2.8
25	16	4.2	4.9	3.5	4.1	2.9	3.4
32	6	2.3	2.8				
32	8	3.0	3.5	2.4	2.9		
32	10	3.6	4.2	3.0	3.5	2.4	2.9
32	12.5	4.4	5.1	3.6	4.2	2.9	3.4
32	16	5.4	6.2	4.5	5.2	3.7	4.3
40	4	2.0	2.4				
40	6	2.8	3.3	2.3	2.8		
40	8	3.7	4.3	3.0	3.5	2.4	2.9
40	10	4.5	5.2	3.7	4.3	3.0	3.5
40	12.5	5.5	6.3	4.5	5.2	3.7	4.3
40	16	6.7	7.6	5.6	6.4	4.6	5.3
50	4	2.4	2.9	2.3	2.8		
50	6	3.5	4.1	2.9	3.4	2.3	2.8
50	8	4.6	5.3	3.8	4.4	3.0	3.5
50	10	5.6	6.4	4.6	5.3	3.7	4.3
50	12.5	6.8	7.7	5.6	6.4	4.6	5.3
50	16	8.4	9.5	6.9	7.8	5.7	6.5
63	2.5	2.0	2.4				
63	4	3.0	3.5	2.5	3.0		
63	6	4.4	5.1	3.6	4.2	2.9	3.4
63	8	5.8	6.6	4.7	5.4	3.8	4.4
63	10	7.20	7.9	5.8	6.6	4.7	5.4
63	12.5	8.6	9.7	7.0	7.9	5.7	6.5
63	16	10.5	11.8	8.7	9.8	7.1	8.1
75	2.5	2.3	2.8				
75	4	3.6	4.2	2.9	3.4		
75	6	5.3	6.1	4.3	5.0	3.5	4.1
75	8	6.9	7.8	5.6	6.4	4.5	5.2
75	10	8.4	9.5	6.9	7.8	5.6	6.4
75	12.5	10.2	11.5	8.4	9.5	6.8	7.7
75	16	12.5	14.0	10.4	11.7	8.5	9.6
90	2.5	2.8	3.3	2.3	2.8		
90	4	4.3	5.0	3.5	4.1		
90	6	6.3	7.2	5.1	5.9	4.1	4.8
90	8	8.2	9.3	6.7	7.6	5.4	6.2
90	10	10.0	11.2	8.2	9.3	6.7	7.6
90	12.5	12.2	13.7	10.0	11.0	8.2	9.3
90	16	15.0	16.7	12.5	14.0	10.2	11.5
110	2.5	3.4	4.0	2.7	3.2		

Wall Thickness For PE Pipe as per IS: 4984

Diameter	Pr. Class	PE 63		PE 80		PE 100	
		Min	Max	Min	Max	Min	Max
mm	PN	mm	mm	mm	mm	mm	mm
110	4	5.3	6.1	4.3	5.0		
110	6	7.7	8.7	6.3	7.2	5.0	5.7
110	8	10.0	11.2	8.2	9.3	6.6	7.5
110	10	12.3	13.8	10.0	11.2	8.1	9.2
110	12.5	14.9	16.6	12.3	13.8	10.0	11.2
110	16	18.4	20.5	15.2	17.0	12.4	13.9
125	2.5	3.8	4.4	3.1	3.7		
125	4	6.0	6.8	4.9	5.6		
125	6	8.8	9.9	7.1	8.1	5.7	6.5
125	8	11.4	12.8	9.3	10.5	7.5	8.5
125	10	13.9	15.5	11.4	12.8	9.2	10.4
125	12.5	16.9	18.8	13.9	15.5	11.3	12.7
125	16	2.9	23.2	17.3	19.3	14.1	15.8
140	2.5	4.3	5.0	3.5	4.1		
140	4	6.7	7.6	5.4	6.2		
140	6	9.8	11.0	8.0	9.0	6.4	7.3
140	8	12.8	14.3	10.4	11.7	8.4	9.5
140	10	15.6	17.4	12.8	14.3	10.3	11.6
140	12.5	19.0	21.1	15.6	17.4	12.7	14.2
140	16	23.4	26.0	19.4	21.6	15.8	17.6
160	2.5	4.9	5.6	4.0	4.6		
160	4	7.7	8.7	6.2	7.1		
160	6	11.2	12.6	9.1	10.3	7.3	8.3
160	8	14.6	16.3	11.9	13.3	9.6	10.8
160	10	17.8	19.8	14.6	16.3	11.8	13.2
160	12.5	21.7	24.1	17.8	19.8	14.5	16.2
160	16	26.7	29.6	22.1	24.6	18.1	20.2
180	2.5	5.5	6.3	4.4	5.1		
180	4	8.6	9.7	7.0	7.9		
180	6	12.6	14.1	10.2	11.5	8.2	9.3
180	8	16.4	18.3	13.4	15.0	10.8	12.1
180	10	20.0	22.2	16.4	18.3	13.3	14.9
180	12.5	24.4	27.1	20.0	22.2	16.3	18.2
180	16	30.0	33.2	24.9	27.6	20.3	22.6
200	2.5	6.1	7.0	4.9	5.6		
200	4	9.6	10.8	7.7	8.7		
200	6	14.0	15.6	11.4	12.8	9.1	10.3
200	8	18.2	20.3	14.9	16.6	12.0	13.4
200	10	22.3	24.8	18.2	20.3	14.8	16.5
200	12.5	27.1	30.1	22.3	24.8	18.1	20.2
200	16	33.4	37.0	27.6	30.6	22.6	25.1
225	2.5	6.9	7.8	5.5	6.3		
225	4	10.8	12.1	8.7	9.8		
225	6	15.7	17.5	12.8	14.3	10.3	11.6
225	8	20.5	22.8	16.7	18.6	13.5	15.1
225	10	25.0	27.7	20.5	22.8	16.6	18.5

Diameter	Pr. Class	PE 63		PE 80		PE 100	
		Min	Max	Min	Max	Min	Max
mm	PN	mm	mm	mm	mm	mm	mm
225	12.5	30.5	33.8	25.0	27.7	20.4	22.7
225	16	37.5	41.5	31.1	34.5	25.4	28.2
250	2.5	7.6	8.6	6.1	7.0		
250	4	12.0	13.4	9.7	10.9		
250	6	17.5	19.5	14.2	15.9	11.4	12.8
250	8	22.8	25.3	18.6	20.7	15.0	16.7
250	10	27.8	30.8	22.8	25.3	18.4	20.5
250	12.5	33.8	37.4	27.8	30.8	22.6	25.1
250	16	41.7	46.1	34.5	38.2	28.2	31.3
280	2.5	8.5	9.6	6.9	7.8		
280	4	13.4	15.0	10.8	12.1		
280	6	19.6	21.8	15.9	17.7	12.8	14.3
280	8	25.5	28.3	20.8	23.1	16.8	18.7
280	10	31.2	34.6	25.5	28.3	20.6	22.9
280	12.5	37.9	41.9	31.2	34.6	25.3	28.1
280	16	46.7	51.6	38.7	42.8	31.6	35.0
315	2.5	9.6	10.8	7.7	8.7		
315	4	15.0	16.7	12.2	13.7		
315	6	22.0	24.4	17.9	19.9	14.4	16.1
315	8	28.7	31.8	23.4	26.0	18.9	21.0
315	10	35.0	38.7	28.7	31.8	23.2	25.8
315	12.5	42.6	47.1	35.0	38.7	28.5	31.6
315	16	52.5	58.0	43.5	48.1	35.5	39.3
355	2.5	10.8	12.1	8.7	9.8		
355	4	17.0	18.9	13.7	15.3		
355	6	24.8	27.5	20.1	22.4	16.2	18.1
355	8	32.3	35.8	26.3	29.2	21.2	23.6
355	10	39.5	43.7	32.3	35.8	26.2	29.1
355	12.5	48.0	53.0	39.5	43.7	32.1	35.6
355	16	29.2	65.4	49.0	54.1	40.0	44.2
400	2.5	12.2	14.3	9.8	11.5		
400	4	19.1	22.2	15.4	18.0		
400	6	28.0	32.4	22.7	26.4	18.2	21.2
400	8	36.4	42.1	29.7	34.4	23.9	27.7
400	10	44.5	51.4	36.4	42.1	29.5	34.2
400	12.5	54.1	62.5	44.5	51.4	36.2	41.9
400	16			55.2	63.7	45.1	52.1
450	2.5	13.7	16.0	11.0	12.9		
450	4	21.5	25.0	17.4	20.3		
450	6	31.4	36.4	25.5	29.6	20.5	23.8
450	8	41.0	47.4	33.4	38.7	26.9	31.2
450	10	50.0	57.7	41.0	47.4	33.1	38.3
450	12.5	60.9	70.3	50.0	57.7	40.7	47.1
450	16					50.8	58.7
500	2.5	15.2	17.7	12.2	14.3		
500	4	23.9	27.7	19.3	22.4		

Diameter	Pr. Class	PE 63		PE 80		PE 100	
		Min	Max	Min	Max	Min	Max
mm	PN	mm	mm	mm	mm	mm	mm
500	6	34.9	40.4	28.4	32.9	22.8	26.5
500	8	45.5	52.6	37.1	42.9	29.9	34.6
500	10	55.6	64.2	45.5	52.6	36.8	42.6
500	12.5	67.6	78.0	55.6	64.2	45.2	52.2
500	16					56.4	65.1
560	2.5	17.0	19.8	13.7	16.0		
560	4	26.7	31.0	21.6	25.1		
560	6	39.1	45.2	31.7	36.7	25.5	29.6
560	8	51.0	58.9	41.5	48.0	33.5	38.8
560	10			51.0	58.9	41.2	47.6
560	12.5					50.6	58.4
560	16						
630	2.5	19.1	22.2	15.4	18.0		
630	4	30.0	34.7	24.3	28.2		
630	6	44.0	50.8	35.7	41.3	28.7	33.3
630	8	57.3	66.1	46.7	54.0	37.7	43.6
630	10			57.3	66.1	46.4	53.6
630	12.5					56.9	65.7
630	16						
710	2.5	21.6	25.1	17.4	20.3		
710	4	33.9	39.2	27.4	31.8		
710	6	49.6	57.3	40.2	46.5	32.3	37.4
710	8			52.6	60.7	42.4	49.0
710	10					52.3	60.4
710	12.5						
710	16						
800	2.5	24.3	28.2	19.6	22.8		
800	4	38.1	44.1	30.8	35.7		
800	6	55.9	64.5	45.3	52.3	36.4	42.1
800	8					47.8	55.2
800	10					58.9	68.0
800	12.5						
800							

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